

PATENT ABSTRACTS OF JAPAN

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(54) NUT

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a plate-like nut easily connectable without rotating, and usable even in a narrow place.



SOLUTION: Plate-like case plates 6 and 7 are arranged in a pair in parallel in the same plane with prescribed clearance between these plates, and a connecting rod inserting hole is formed in the longitudinal direction by the clearance. Taper surfaces 8 and 9 having an outward opening rear part are formed on the respective insides of both case plates 6 and 7, and locking members 10 and 11 are respectively arranged in both taper surface 8, 9 parts so as to be movable in the longitudinal direction along the taper surfaces 8 and 9. Respective inside surfaces of both locking members 10 and 11 are formed as a recess-projection surface in the direction parallel to the axis of the connecting rod inserting hole. The locking members 10 and 11 are energized forward by energizing means 20 and 21. The obverse and the reverse of both case plates 6 and 7 are covered with a plate material.

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CLAIMS

[Claim(s)]

[Claim 1]In the same flat surface for a plate-like case board, have a predetermined crevice between a couple and these, arrange in parallel, form a coupling rod insertion hole in a cross direction by this crevice, and inside [each] this both case board, Back forms a tapered surface opened outside and arranges a locking member movable along a tapered surface at a cross direction, respectively to these both tapered face parts, A nut which forms each medial surface of both locking members in a rugged surface in a direction which is parallel to an axial center of said coupling rod insertion hole, energizes said locking member to the front by an energizing means further, and is further

characterized by covering a surface and rear surface of said both case board with a plate.

[Claim 2] In the same flat surface for a plate-like case board, have a predetermined crevice between a couple and these, arrange in parallel, form a coupling rod insertion hole in a cross direction by this crevice, and inside [each] this both case board, Back forms a tapered surface opened outside and arranges a locking member movable along a tapered surface at a cross direction, respectively to these both tapered face parts, A nut which forms each medial surface of both locking members in a flat face which is parallel to an axial center of said coupling rod insertion hole, energizes said locking member to the front by an energizing means further, and is further characterized by covering a surface and rear surface of said both case board with a plate.

[Claim 3] Between a couple and these, have a predetermined crevice on the surface of a plate-like rear cover, arrange a plate-like back spacer on it in parallel, and a coupling rod insertion hole is formed in it by this crevice at a cross direction, arranging a plate-like case board on said both back spacer, respectively — a case of these couples — it having a predetermined crevice in a wooden floor, and a coupling rod insertion hole being formed in a cross direction, and inside [each] said both case board, Back forms a tapered surface opened outside and arranges a locking member movable along a tapered surface at a cross direction, respectively to these both tapered face parts, Each medial surface of both locking members is formed in a rugged surface in a direction which is parallel to an axial center of said coupling rod insertion hole, Energize said locking member to the front by an energizing means, and further in the surface of said both locking members. Arrange a top-plate-like front spacer, respectively and to this both front spacer. A nut which forms a guidance long hole along a tapered surface formed in said case board, protrudes guide pins on the surface of said both locking members, fits these guide pins into said guidance long hole so that sliding is possible, and is further characterized by covering the surface of said both front spacer with a plate-like front cover.

[Claim 4] Between a couple and these, have a predetermined crevice on the surface of a plate-like rear cover, arrange a plate-like back spacer on it in parallel, and a coupling rod insertion hole is formed in it by this crevice at a cross direction, arranging a plate-like case board on said both back spacer, respectively — a case of these couples — it having a predetermined crevice in a wooden floor, and a coupling rod insertion hole being formed in a cross direction, and inside [each] said both case board, Back forms a tapered surface opened outside and arranges a locking member movable along a tapered surface at a cross direction, respectively to these both tapered face parts, Form each medial surface of both locking members in a flat face which is parallel to an axial center of said coupling rod insertion hole, energize said locking member to the front by an energizing means, and further in the surface of said both locking members. Arrange a top-plate-like front spacer, respectively and to this both front spacer. A nut which forms a guidance long hole along a tapered surface formed in said case board, protrudes guide pins on the surface of said both locking members, fits these guide pins into said guidance long hole so that sliding is possible, and is further characterized by covering the surface of said both front spacer with a plate-like front cover.

[Claim 5] The nut according to any one of claims 1 to 4 which established a release means which can move said both locking members to back from the exterior of a nut.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a nut.

[0002]

[Description of the Prior Art] Conventionally, it inserts to a bolt, without rotating to a bolting position, and the nut which can ***** by rotating a little in a bolting position is known (for example, JP,55-48171,Y).

[0003] Without providing two or more fluting segments movable to shaft orientations over the perimeter of that hoop direction in that nut, and rotating a bolt, by inserting into a nut, this nut pushes two or more fluting segments, and can be connected.

[0004]

[Problem(s) to be Solved by the Invention] In the nut which arranges a fluting segment over the perimeter of a hoop direction like said before, since two or more segments are arranged over the perimeter of the axis of a nut, the outer diameter of the nut becomes large. Therefore, the occupation space of a nut becomes large and there is a problem which cannot perform use at a narrow place.

[0005] Then, an object of this invention is to provide the nut which can respond when it can insert in coupling rods, such as a bolt, by nonrotation, and it can dissociate at the time of necessity and use at a narrow place is required.

[0006]

[Means for Solving the Problem] In order to solve the aforementioned technical problem, the 1st invention according to claim 1, In the same flat surface for a plate-like case board, have a predetermined crevice between a couple and these, arrange in parallel, form a coupling rod insertion hole in a cross direction by this crevice, and inside [each] this both case board, Back forms a tapered surface opened outside and arranges a locking member movable along a tapered surface at a cross direction, respectively to these both tapered face parts, In a direction which is parallel to an axial center of said coupling rod insertion hole, each medial surface of both locking members was formed in a rugged surface, said locking member was further energized to the front by an energizing means, and a surface and rear surface of said both case board was further covered with a plate.

[0007] In the same flat surface for a plate-like case board, between a couple and these, the 2nd invention according to claim 2 has a predetermined crevice, and arranges it in parallel, Form a coupling rod insertion hole in a cross direction by this crevice, and inside [each] this both case board, Back forms a tapered surface opened outside and arranges a locking member movable along a tapered surface at a cross direction, respectively to these both tapered face parts, Each medial surface of both locking members was formed in a flat face which is parallel to an axial center of said coupling rod insertion hole, said locking member was further energized to the front by an energizing means, and a surface and rear surface of said both case board was further covered with a plate.

[0008] The 3rd invention according to claim 3 a plate-like back spacer on the surface of a plate-like rear cover A couple, Among these, have a predetermined crevice, arrange in parallel and a coupling rod insertion hole is formed by this crevice at a cross direction, arranging a plate-like case board on said both back spacer, respectively — a case of these couples — it having a predetermined crevice in a wooden floor, and a coupling rod insertion hole being formed in a cross direction, and inside [each] said both case board. Back forms a tapered surface opened outside and arranges a locking

member movable along a tapered surface at a cross direction, respectively to these both tapered face parts. Each medial surface of both locking members is formed in a rugged surface in a direction which is parallel to an axial center of said coupling rod insertion hole, Energize said locking member to the front by an energizing means, and further in the surface of said both locking members.

Arrange a top-plate-like front spacer, respectively and to this both front spacer. A guidance long hole along a tapered surface formed in said case board was formed, guide pins were protruded on the surface of said both locking members, these guide pins were fitted into said guidance long hole so that sliding was possible, and the surface of said both front spacer was further covered with a plate-like front cover.

[0009]The 4th invention according to claim 4 a plate-like back spacer on the surface of a plate-like rear cover A couple, Among these, have a predetermined crevice, arrange in parallel and a coupling rod insertion hole is formed by this crevice at a cross direction, arranging a plate-like case board on said both back spacer, respectively — a case of these couples — it having a predetermined crevice in a wooden floor, and a coupling rod insertion hole being formed in a cross direction, and inside [each] said both case board. Back forms a tapered surface opened outside and arranges a locking member movable along a tapered surface at a cross direction, respectively to these both tapered face parts, Form each medial surface of both locking members in a flat face which is parallel to an axial center of said coupling rod insertion hole, energize said locking member to the front by an energizing means, and further in the surface of said both locking members. Arrange a top-plate-like front spacer, respectively and to this both front spacer. A guidance long hole along a tapered surface formed in said case board was formed, guide pins were protruded on the surface of said both locking members, these guide pins were fitted into said guidance long hole so that sliding was possible, and the surface of said both front spacer was further covered with a plate-like front cover.

[0010]The 5th invention according to claim 5 establishes a release means which can move said both locking members to back from the exterior of a nut in said 1st [the 3 thru/or the 4th one of inventions.

[0011]

[Embodiment of the Invention]An embodiment of the invention is described based on the example shown in a figure.

[0012]Drawing 1 thru/or drawing 9 are the examples of the nut connected with this bolt using the bolt which formed the spiral slot as a coupling rod.

[0013]As shown in drawing 1, the nut 1 laminates each plate material and is formed in tabular, and the rear cover 2 which is the part to constitute is formed with the metaled plate.

[0014][surface / of said rear cover 2 / in the same flat surface] the back spacers 3 and 4 of a couple, On both sides of center-section X1-X2 which inserts in the bolt 5, it has the predetermined crevice D1 right and left, and is arranged in parallel, and the crevice D1 between these back spacers 3 and 4 forms a part of bolt insertion hole penetrated to a cross direction (let a X1-X 2-way be a cross direction). These back spacers 3 and 4 are formed with the metaled plate.

[0015]The case boards 6 and 7 of a couple have the predetermined crevice D2 on both sides of center-section X1-X2 in which said bolt 5 is inserted, and are arranged in parallel, and a part of bolt insertion hole which the crevice D2 between the case boards 6 and 7 of these couples penetrates to a cross direction is formed in the surface side of the back spacers 3 and 4 of said couple. The tapered surfaces 8 and 9 where back (X2 side) spreads outside are formed in each medial surface of the case boards 6 and 7 of this couple. The case boards 6 and 7 of this couple are formed with the metaled plate, respectively.

[0016]Inside [each] the case boards 6 and 7 of said couple, the locking members 10 and 11 of the wedge action die are arranged, respectively. The thread grooves 10a and 11a which are the rugged surfaces of the shape of a gear tooth which consists of a mountain and a valley along the insert direction (said X1-X 2-way) of said bolt 5 are engraved on the medial surface of each of these

locking members 10 and 11. As shown in drawing 6 (b), these thread grooves 10a and 11a are formed at a part of thread groove 5a of the bolt 5, and circle of the abbreviated EQC, as shown in drawing 6 (c), so that it may be formed on a par with the pitch of thread of the thread groove 5a of the bolt 5 and may gear along with the thread groove of the bolt 5. The lateral surface of these locking members 10 and 11 is formed in the tapered surfaces 10b and 11b along said tapered surfaces 8 and 9. Said each locking members 10 and 11 are formed with metal, and the guide pins 12 and 13 protrude on the surface side upwards, respectively.

[0017]The compound-screw slots 10a and 11a of both the locking members 10 and 11, As shown in drawing 5, when inserting the bolt 5 and meshing the thread grooves 10a and 11a, After the tapered surfaces 10b and 11b of both the locking members 10 and 11 have contacted the tapered surfaces 8 and 9, both the compound-screw slots 10a and 11a are set up shift to a bolt insert direction only 1/2 pitch as P of drawing 7 shows.

[0018]Thus, the compound-screw slot 10a and the method of shifting the pitch between 11a 1/2, As are shown in drawing 7, and both the locking members 10 and 11 that formed the thread grooves 10a and 11a in status idem may be shifted to a bolt insert direction 1/2 pitch and it is shown in drawing 8, As it may be made to arrange both the locking members 10 and 11 that shifted the thread grooves 10a and 11a 1/2 pitch mutually, and formed them in the bolt insert direction in the same position in a bolt insert direction and they are further shown in drawing 9, 1/2 pitch of specified quantity P, i.e., a thread groove, may shift the tapered surfaces 8 and 9 to a bolt insert direction mutually using both the locking members 10 and 11 that formed the thread grooves 10a and 11a in status idem.

[0019]In the surface of the case boards 6 and 7 of said couple, the front spacers 14 and 15 of the couple which consists of a metal plate have the predetermined crevice D3 like the back spacers 3 and 4 of said couple, and are arranged in parallel on it. The guidance long holes 16 and 17 which fit in so that sliding is possible penetrate in the direction of a rear surface, and the guide pins 12 and 13 of said locking members 10 and 11 are formed in the front spacers 14 and 15 of this couple. Along said tapered surfaces 8 and 9, it inclines and is formed in these guidance long holes 16 and 17 so that back may spread outside. The stopper surfaces 16a and 17a are formed in the front side of the guidance long holes 16 and 17.

[0020]The bolt insertion hole 40 penetrated to a cross direction is formed by said each crevice D1, D2, and D3.

[0021]The storage rooms 18 and 19 are formed at the rear of the tapered surfaces 8 and 9, the energizing members 20 and 21 are stored in this storage room 18 and 19, and the energizing members 20 and 21 are outside de***** (ed) by said case boards 6 and 7 with said reverse side spacers 3 and 4 and the front spacers 14 and 15. And it is energizing so that the opposed interval to the front 10 and 11, i.e., both locking members, may always become narrow about said locking members 10 and 11 by these energizing members 20 and 21. Although the coil spring was used for this energizing member (energizing means) in the example of the figure, the member which consists of spring materials, such as rubber, may be used for it.

[0022]The one front cover 22 over between these is arranged at the surface side of the front spacers 14 and 15 of said couple. In the same position as said guidance long holes 16 and 17, the guidance long holes 23 and 24 of the couple which inclines in a uniform direction are formed in this front cover 22. The guidance long holes 23 and 24 of this couple are penetrated in the direction of a rear surface of the front cover 22. This front cover 22 is formed with the metal plate.

[0023]It extracts and the jig 25 is arranged at the cross direction at the surface side of said front cover 22 so that sliding is possible.

[0024]The aforementioned omission jig 25 is formed in the rear with the plate of the metal which has the wide suspending portion 26, and the front end lock face 26a and the back end lock face 26b are formed in this suspending portion 26. The crevices 27 and 28 into which said both guide pins 12 and 13 fit, respectively are formed in the back side of this **** jig 25. The cross-direction length of

these crevices 27 and 28 is formed in the cross-direction length and almost same length of the guide pins 12 and 13, and longitudinal-direction length is formed for a long time than the longitudinal-direction length of the guide pins 12 and 13. It extracts and the final controlling element 29 of width shorter than the right and left width of the suspending portion 26 protrudes on the surface of the jig 25 at one.

[0025]The covering 30 is arranged on the side front of the aforementioned omission jig 25.

[0026]The guiding recess 31 in which a rear face carries out an opening is formed in the back side of this front cover 30, and the aforementioned omission jig 25 fits in movable in this guiding recess 31 at a cross direction. The front end of this guiding recess 31 serves as the front end regulating surface 31a where the front end lock face 26a of the aforementioned omission jig 25 hits, and the back end has become the back end regulating surface 31b where it extracts and the back end lock face 26b of the jig 25 hits. The window 32 to which said final controlling element 29 fits into a cross direction movable is formed in the center section of the covering 30.

[0027]said guide pins 12 and 13 and the guidance long holes 16 and 17 — it extracts and the release means 33 is formed by the jig 25, the final controlling element 29, etc.

[0028]The hole 34 for attachment is formed in the position which is common in said each member, connecting members, such as the screw 35, are inserted in this each hole 34 for attachment, each member is connected in one, and the nut 1 is constituted.

[0029]Next, the operation which uses the nut 1 of said example, for example, connects both panels is explained.

[0030]As shown in drawing 1 and drawing 5, suitably, fix to the panel 50 by a means and the insertion side edge of the bolt insertion hole 40 of the nut 1 equips the connection side edge 50a of one panel 50 with said nut 1 at it so that while may be located, It is made to project from the connection side edge 60a of the panel 60 of another side, and the tip part fixes to the panel 60 of another side by a means suitably, and is provided with the bolt 5.

[0031]And in the state where both the locking members 10 and 11 are located ahead, and between both the thread grooves 11a [10a and] ϕ is in an interval shorter than the diameter of the thread groove 5a of the bolt 5, If both the panels 50 and 60 are approached mutually and the bolt 5 is inserted in the bolt insert hole 40 of the nut 1, First, the tip part of the bolt 5 is equivalent to the tip part of the locking members 10 and 11 in the position shown in drawing 7, drawing 8, or drawing 9, and the locking members 10 and 11 resist the energizing force of the coil springs 20 and 21, and are pushed and moved to an inner. Movement of these locking members 10 and 11 moves back along the tapered surfaces 8 and 9 by the guidance oblong holes 16 and 17 and the pins 12 and 13, and the distance between opposite of both the locking members 10 and 11 becomes long (widely) gradually.

[0032]And if the opposed interval of the peak parts of the thread grooves 10a and 11a in both the locking members 10 and 11 becomes larger than the diameter of the peak parts of the bolt 5, both the locking members 10 and 11 will be pushed and moved to the front by insertion of the bolt 5 according to the energizing force of the coil springs 20 and 21. If this is repeated, the bolt 5 is inserted and the connection side edges 50a and 60a of both the panels 50 and 60 contact, as shown in drawing 5, the locking members 10 and 11 will stop at the state where the thread grooves 10a and 11a of both the locking members 10 and 11 geared to the thread groove 5a of the bolt 5. At this time, the thread groove 10a of both the locking members 10 and 11 and both 11a shift 1/2 pitch, and the compound-screw slots 10a and 11a gear to the thread groove 5a of the bolt 5, and the tapered surfaces 10b and 11b touch the tapered surfaces 8 and 9.

[0033]If the power which it is going to divide into both the panels 50 and 60 acts in this state (i.e., if the power to the direction which escapes from the nut 1 acts on the bolt 5), the power to the front will act on the locking members 10 and 11 which have geared to the thread groove 5a of the bolt 5, but. The thread grooves 10a and 11a of the locking members 10 and 11 eat to the thread groove 5a of the bolt 5, and the omission blank of the bolt 5 is prevented by engagement of the tapered

surfaces 10b and 11b of the locking members 10 and 11, and the tapered surfaces 8 and 9 of the case boards 6 and 7, having shifted the compound-screw slots 10a and 11a 1/2 pitch as mentioned above at this time -- the thread groove 5a of the thread grooves 10a and 11a -- it eating and in the state of a lump, Since the tapered surfaces 10b and 11b and the tapered surfaces 8 and 9 are in a contact state, the omission blank of the bolt 5 is prevented firmly and both the panels 50 and 60 are connected mutually firmly.

[0034]Therefore, when connecting both the panels 50 and 60, compared with what rotates and connects a nut to a bolt like before only in the work which approaches both the panels 50 and 60 mutually, connecting operation is easy.

[0035]Next, in separating both the panels 50 and 60 from the aforementioned connecting state, the tip of the final controlling element 29 exposed to the covering 30 is moved back (the direction of arrow A of drawing 1) by manual operation, and it moves both the locking members 10 and 11 back. In both the locking members 10 and 11, the interval phi between both the locking members 10 and 11 spreads by the guidance long holes 16 and 17 by this, If that interval phi becomes larger than the diameter of the peak parts of the bolt 5, the bolt 5 can be extracted and removed, and both the panels 50 and 60 can be separated by extracting and removing this bolt 5.

[0036]It is not necessary to rotate the nut 1 like before also in this separation work, and separation work can also be performed easily.

[0037]Although it is an example which uses the bolt 5 which has the spiral thread groove 5a in said example, It is good also as the non-inclined grooves 10c and 11c which use this bolt 5 as the coupling rod 5A which formed not a spiral slot but the slot 5c on the ring shape in the periphery as shown in drawing 10, and fit the thread grooves 10a and 11a of said locking members 10 and 11 into the slot 5c of said ring shape.

[0038]In said example, although the coupling rod 5A which has the bolt 5 which has the thread groove 5a, and the ring groove 5c was used, the coupling rod 5C of the shape of a square bar as shown in the coupling rod 5B and drawing 12 of the round bar shape which does not have a rugged surface in shaft orientations on the surface as shown in drawing 11 may be used. Even if it is the coupling rods 5B and 5C of such a non-rugged surface, by forming the medial surface of both the locking members 10 and 11 in a point **like rugged surface as mentioned above, this rugged surface eats to said coupling rods 5B and 5C, and the same connection as the above is possible. It is made the rugged surface which consists of a straight line of a sliding direction, without making the medial surface of both the locking members 10 and 11 into a circle in drawing 6 (c) or drawing 10 (c), in using the coupling rod 5C of the shape of a square bar as shown in drawing 12.

[0039]Without forming the medial surface of said both locking members 10 and 11 in the rugged surface which consists of thread grooves as mentioned above, as shown in drawing 13, it may form in the flat faces 10d and 11d which are parallel to the axial center of said bolt insertion hole. In this case, by using the above bolts 5 and the coupling rods 5A, the mountain of that thread groove 5a and the mountain of the ring groove 5c eat to the flat faces 10d and 11d of both the locking members 10 and 11, and can connect like said example.

[0040]In said example, although the cross direction of the nut 1 was made to penetrate the bolt insert hole 40 of the nut 1, the rear of this bolt insert hole 40 may be blocked.

[0041]The nut 1 of this invention of it not restricting to the thing of connection of the above panels, and being used also for connection of other parts is natural.

[0042]

[Effect of the Invention]Since it is above, and the nut of this invention can be connected, without rotating to coupling rods which have an uneven part, such as a round bar and a square bar, on a bolt or a periphery, compared with a nut like before rotated and connected, connecting operation is easy for it.

[0043]When screwing the nut of this invention in a bolt, a nut can be inserted in even if some screw threads of the bolt are damaged.

[0044] Since the nut of this invention countered on one flat surface and has arranged two locking members, it can form a nut in tabular thin compared with what arranges a fluting segment to the perimeter like said before. Therefore, it is effective in connection at a narrow place.

[0045] Since it is monotonous and most parts can be formed, parts can be manufactured by the press or forge and reduction of a manufacturing cost can be aimed at.

[0046] According to the invention of claim 5, it can remove easily, without rotating the connected nut.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The perspective view showing the example of this invention.

[Drawing 2] The elevation of the nut of this invention.

[Drawing 3] The B-B line sectional view in drawing 1.

[Drawing 4] The perspective view which decomposed the parts of the nut of this invention.

[Drawing 5] The top view in the state where the front cover was removed in the nut of this invention.

[Drawing 6] It is a C-C line sectional view [in / (b) can set (a) in the side view of a bolt, can be set to the medial-surface figure of a locking member, and / the bolt and locking member in the example which connects the nut of this invention with a bolt are shown, and / in (c) / (b)].

[Drawing 7] The top view showing the arrangement state of the locking member in this invention.

[Drawing 8] The top view showing other examples of the locking member in this invention.

[Drawing 9] The top view showing the example of further others of the locking member in this invention.

[Drawing 10] It is a D-D line sectional view [in / (b) can set (a) in the side view of a coupling rod, can be set to the medial-surface figure of a locking member, and / the coupling rod and locking member in the example which connects the nut of this invention with the coupling rod in which the un-spiral ring groove was formed are shown, and / in (c) / (b)].

[Drawing 11] The perspective view showing other examples of the coupling rod connected with the nut of this invention.

[Drawing 12] The perspective view showing the example of further others of the coupling rod connected with the nut of this invention.

[Drawing 13] The perspective view showing other examples of the locking member of this invention.

[Description of Notations]

1 Nut

2 Rear cover

3 and 4 Back spacer

5, 5A-5C Coupling rod
6 and 7 Case board
8, 9 tapered surfaces
10 and 11 Locking member
10a, 11a, and 10c Rugged surface
10d and 11d Flat face
12, 13 guide pins
14 and 15 Front spacer
16 and 17 Guidance long hole
20 and 21 Energizing means
22 Front cover
33 Release means

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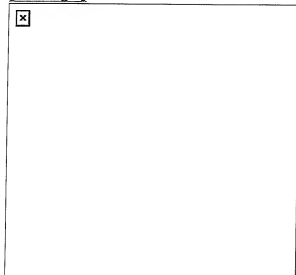
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DRAWINGS

[Drawing 1]



[Drawing 2]

【特許請求の範囲】

【請求項1】 平板状のケース板を同一平面内において一対、これらの間に所定の隙間を有して平行に配置して、該隙間により連結棒挿入孔を前後方向に形成し、該両ケース板の夫々の内側には、後方が外側へ開くテーパー面を形成し、該両テーパー面部には夫々係止部材をテーパー面に沿って前後方向に移動可能に配置し、更に、両係止部材の夫々の内側面を、前記連結棒挿入孔の軸心に平行する方向において凹凸面に形成し、更に、前記係止部材を付勢手段により前方へ付勢し、更に、前記両ケース板の表裏面を板材で被覆したことを特徴とするナット。

【請求項2】 平板状のケース板を同一平面内において一対、これらの間に所定の隙間を有して平行に配置して、該隙間により連結棒挿入孔を前後方向に形成し、該両ケース板の夫々の内側には、後方が外側へ開くテーパー面を形成し、該両テーパー面部には夫々係止部材をテーパー面に沿って前後方向に移動可能に配置し、更に、両係止部材の夫々の内側面を、前記連結棒挿入孔の軸心と平行する平坦面に形成し、更に、前記係止部材を付勢手段により前方へ付勢し、更に、前記両ケース板の表裏面を板材で被覆したことを特徴とするナット。

【請求項3】 平板状の裏カバーの表面に、平板状の裏スベサを一対、これらの間に所定の隙間を有して平行に配置して該隙間により連結棒挿入孔を前後方向に形成し、前記両裏スベサ上に夫々平板状のケース板を配置してこれら一対のケース板の間に所定の隙間を有して連結棒挿入孔を前後方向に形成し、前記両ケース板の夫々の内側には、後方が外側へ開くテーパー面を形成し、該両テーパー面部には夫々係止部材をテーパー面に沿って前後方向に移動可能に配置し、更に、両係止部材の夫々の内側面を、前記連結棒挿入孔の軸心に平行する方向において凹凸面に形成し、更に、前記係止部材を付勢手段により前方へ付勢し、更に、前記両係止部材の表面には、夫々天板状の表スベサを配置し、該両表スベサには、前記ケース板に形成したテーパー面に沿った案内長孔を形成し、前記両係止部材の表面に案内ピンを突設して該案内ピンを前記案内長孔に摺動可能に嵌合し、更に、前記両表スベサの表面を平板状の表カバーで被覆したことを特徴とするナット。

【請求項4】 平板状の裏カバーの表面に、平板状の裏スベサを一対、これらの間に所定の隙間を有して平行に配置して該隙間により連結棒挿入孔を前後方向に形成し、前記両裏スベサ上に夫々平板状のケース板を配置してこれら一対のケース板の間に所定の隙間を有して連結棒挿入孔を前後方向に形成し、前記両ケース板の夫々の内側には、後方が外側へ開くテーパー面を形成し、該両テーパー面部には夫々係止部材をテーパー面に沿って前後方向に移動可能に配置し、更に、両係止部材の夫々の内側面を、前記連結棒挿入孔の軸心と平行する平坦面に形成し、更に、前記係止部材を付勢手段により前方へ付勢

し、更に、前記両係止部材の表面には、夫々天板状の表スベサを配置し、該両表スベサには、前記ケース板に形成したテーパー面に沿った案内長孔を形成し、前記両係止部材の表面に案内ピンを突設して該案内ピンを前記案内長孔に摺動可能に嵌合し、更に、前記両表スベサの表面を平板状の表カバーで被覆したことを特徴とするナット。

【請求項5】 前記両係止部材をナットの外部から後方へ移動できる解除手段を設けた請求項1乃至4のいずれかに記載のナット。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、ナットに関する。

【0002】

【従来の技術】従来、ボルトに対し、締め付け位置まで回転することなく挿入し、締め付け位置で若干回転することにより完結できるナットが知られている（例えば実昭55-48171号公報）。

【0003】このナットは、そのナット内にその周方向の全周にわたって複数の溝付セグメントを軸方向に移動可能に設け、ボルトを回転することなくナット内へ挿入することで複数の溝付セグメントを押して連結できるようにしている。

【0004】

【発明が解決しようとする課題】前記従来のような周方向の全周にわたって溝付セグメントを配置するナットにおいては、ナットの軸芯の全周にわたって複数のセグメントが配置されるため、そのナットの外径が大きくなる。そのため、ナットの占有空間が大きくなり、狭い場所での使用ができない問題がある。

【0005】そこで本発明は、無回転でボルトなどの連結棒に挿入することができ、また、必要時には分離でき、かつ、狭い場所での使用が要求される場合においても対応できるナットを提供することを目的とするものである。

【0006】

【課題を解決するための手段】前記の課題を解決するために、請求項1記載の第1の発明は、平板状のケース板を同一平面内において一対、これらの間に所定の隙間を有して平行に配置して、該隙間により連結棒挿入孔を前後方向に形成し、該両ケース板の夫々の内側には、後方が外側へ開くテーパー面を形成し、該両テーパー面部には夫々係止部材をテーパー面に沿って前後方向に移動可能に配置し、更に、両係止部材の夫々の内側面を、前記連結棒挿入孔の軸心に平行する方向において凹凸面に形成し、更に、前記係止部材を付勢手段により前方へ付勢し、更に、前記両ケース板の表裏面を板材で被覆したことを特徴とするものである。

【0007】請求項2記載の第2の発明は、平板状のケース板を同一平面内において一対、これらの間に所定の

隙間を有して平行に配置して、該隙間により連結棒挿入孔を前後方向に形成し、該両ケース板の夫々の内側には、後方が外側へ開くテーパー面を形成し、該両テーパー面には夫々係止部材をテーパー面に沿って前後方向に移動可能に配置し、更に、両係止部材の夫々の内側面を、前記連結棒挿入孔の軸心と平行する平坦面に形成し、更に、前記係止部材を付勢手段により前方へ付勢し、更に、前記両ケース板の表裏面を板材で被覆したことを特徴とするものである。

【0008】請求項3記載の第3の発明は、平板状の裏カバーの表面に、平板状の裏スベサを一對、これらの間に所定の隙間を有して平行に配置して該隙間により連結棒挿入孔を前後方向に形成し、前記両裏スベサ上に夫々平板状のケース板を配置してこれら一對のケース板の間に所定の隙間を有して連結棒挿入孔を前後方向に形成し、前記両ケース板の夫々の内側には、後方が外側へ開くテーパー面を形成し、該両テーパー面には夫々係止部材をテーパー面に沿って前後方向に移動可能に配置し、更に、両係止部材の夫々の内側面を、前記連結棒挿入孔の軸心に平行する方向において凹凸面に形成し、更に、前記係止部材を付勢手段により前方へ付勢し、更に、前記両係止部材の表面には、夫々天板状の表スベサを配置し、該両表スベサには、前記ケース板に形成したテーパー面に沿った案内長孔を形成し、前記両係止部材の表面に案内ピンを突設して該案内ピンを前記案内長孔に摺動可能に嵌合し、更に、前記両表スベサの表面を平板状の表カバーで被覆したことを特徴とするものである。

【0009】請求項4記載の第4の発明は、平板状の裏カバーの表面に、平板状の裏スベサを一對、これらの間に所定の隙間を有して平行に配置して該隙間により連結棒挿入孔を前後方向に形成し、前記両裏スベサ上に夫々平板状のケース板を配置してこれら一對のケース板の間に所定の隙間を有して連結棒挿入孔を前後方向に形成し、前記両ケース板の夫々の内側には、後方が外側へ開くテーパー面を形成し、該両テーパー面には夫々係止部材をテーパー面に沿って前後方向に移動可能に配置し、更に、両係止部材の夫々の内側面を、前記連結棒挿入孔の軸心と平行する平坦面に形成し、更に、前記係止部材を付勢手段により前方へ付勢し、更に、前記両係止部材の表面には、夫々天板状の表スベサを配置し、該両表スベサには、前記ケース板に形成したテーパー面に沿った案内長孔を形成し、前記両係止部材の表面に案内ピンを突設して該案内ピンを前記案内長孔に摺動可能に嵌合し、更に、前記両表スベサの表面を平板状の表カバーで被覆したことを特徴とするものである。

【0010】請求項5記載の第5の発明は、前記第1乃至第4のいずれかの発明において、前記両係止部材をナットの外部から後方へ移動できる解除手段を設けたものである。

【0011】

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【発明の実施の形態】図に示す実施例に基づいて本発明の実施の形態について説明する。

【0012】図1乃至図9は、連結棒として螺旋溝を形成したボルトを用い、このボルトに連結するようにしたナットの実施例である。

【0013】ナット1は図1に示すように、各平板材を積層して板状に形成されており、その構成する部品である裏カバー2は金属の平板で形成されている。

【0014】前記裏カバー2の表面には一對の裏スベサ3、4が、同一平面内において、ボルト5を挿通する中央部X1-X2を挟んで左右に所定の隙間D1を有して平行に配置され、これらの裏スベサ3、4の間の隙間D1が、前後方向(X1-X2方向を前後方向とする)に貫通するボルト挿通孔の一部を形成している。該裏スベサ3、4は金属の平板で形成されている。

【0015】前記一對の裏スベサ3、4の表面側には一對のケース板6、7が、前記ボルト5が挿通される中央部X1-X2を挟んで所定の隙間D2を有して平行に配置され、これら一對のケース板6、7の間の隙間D2が前後方向に貫通するボルト挿通孔の一部を形成している。該一對のケース板6、7の夫々の内側面には、後方(X2側)が外側へ広がるテーパー面8、9が形成されている。該一對のケース板6、7は夫々金属の平板で形成されている。

【0016】前記一對のケース板6、7の夫々の内側には夫々楔型の係止部材10、11が配置されている。該各係止部材10、11の内側面には前記ボルト5の挿通方向(前記X1-X2方向)に沿って山と谷からなる歯状の凹凸面であるねじ溝10a、11aが刻設されている。該ねじ溝10a、11aは、図6(b)に示すように、ボルト5のねじ溝5aのねじピッチと同等に形成され、かつ、ボルト5のねじ溝に沿って啮合するように、図6(c)に示すようにボルト5のねじ溝5aと略同等の円弧の一部で形成されている。また、該係止部材10、11の外側面は前記テーパー面8、9に沿ったテーパー面10b、11bに形成されている。更に、前記各係止部材10、11は金属で形成され、またその表面側には夫々案内ピン12、13が上方へ突設されている。

【0017】更に、両係止部材10、11の両ねじ溝10a、11aは、図5に示すようにボルト5を挿入してねじ溝10a、11aに啮合させた場合に、両係止部材10、11のテーパー面10b、11bがテーパー面8、9に当接した状態で両ねじ溝10a、11aの相互が、図7のPで示すように1/2ピッチだけボルト挿通方向へずれるように設定されている。

【0018】このように両ねじ溝10a、11a相互のピッチを1/2ずらす方法は、図7に示すように、ねじ溝10a、11aを同一状態に形成した両係止部材10、11をボルト挿通方向へ1/2ピッチずらしてもよく、また、図8に示すように、ねじ溝10a、11aを

相互にボルト挿通方向に1/2ピッチずらして形成した
 両係止部材10, 11を、ボルト挿通方向において同一
 位置に配置するようにしてもよく、更に、図9に示すよ
 うに、ねじ溝10a, 11aを同一状態に形成した両係
 止部材10, 11を用い、テーパー面8, 9を相互にボ
 ルト挿通方向へ所定量P、すなわちねじ溝1/2ピッチだ
 けずらしてもよい。

【0019】前記一对のケース板6, 7の表面には金属
 の平板からなる一对の表スベサ14, 15が、前記一
 対の裏スベサ3, 4と同様に所定の隙間D3を有して
 平行に配置されている。該一对の表スベサ14, 15
 には、前記係止部材10, 11の案内ピン12, 13が
 摺動可能に嵌合する案内長孔16, 17が表裏方向に貫
 通して形成されている。該案内長孔16, 17には前記
 テーパー面8, 9に沿って、すなわち、後方が外側へ拡
 がるように傾斜して形成されている。また、案内長孔1
 6, 17の前側にはストップ面16a, 17aが形成され
 ている。

【0020】前記各隙間D1, D2, D3によって、前
 後方向に貫通するボルト挿通孔40を形成している。

【0021】また、前記ケース板6, 7には、テーパー面
 8, 9の後部において収納室18, 19が形成されてお
 り、該収納室18, 19内に付勢部材20, 21を収納し
 、前記裏スベサ3, 4と表スベサ14, 15で付
 勢部材20, 21の外脱が阻止されている。そして、該
 付勢部材20, 21により前記係止部材10, 11を常
 時前方へ、すなわち両係止部材10, 11の対向間隔が
 狭くなるように付勢している。なお、該付勢部材(付勢
 手段)は、図の例ではコイルスプリングを使用した、
 ゴム等の弾性材料からなる部材を使用してもよい。

【0022】前記一对の表スベサ14, 15の表面側
 には、これらの間にわたる1枚の表カバー22が配置さ
 れている。該表カバー22には、前記案内長孔16, 1
 7と同一位置において、かつ、同一方向に傾斜する一
 対の案内長孔23, 24が形成されている。該一对の案内
 長孔23, 24は表カバー22の表裏方向に貫通してい
 る。また、該表カバー22は金属の平板で形成されてい
 る。

【0023】前記表カバー22の表面側には、抜き治具
 25が前後方向に摺動可能に配置されている。

【0024】前記抜き治具25は、後部に幅の広い係止
 部26を有する金属の平板で形成され、該係止部26に
 前端係止面26aと後端係止面26bが形成されてい
 る。更に、該抜き治具25の裏側には、前記案内ピン
 12, 13が夫々嵌合する凹部27, 28が形成されて
 いる。該凹部27, 28の前後方向長は案内ピン12,
 13の前後方向長と略同長に形成され、左右方向長は案
 内ピン12, 13の左右方向長よりも長く形成されてい
 る。更に、抜き治具25の表面には、係止部26の左右
 幅より短い幅の操作部29が一体に突設されている。

【0025】前記抜き治具25の表側にはカバー30が
 配置されている。

【0026】該表カバー30の裏側には裏面が開口する
 案内凹部31が形成されており、該案内凹部31内に前
 記抜き治具25が前後方向に移動可能に嵌合される。更
 に、該案内凹部31の前端は前記抜き治具25の前端係
 止面26aが当たった前端規制面31aとなっており、後
 端は抜き治具25の後端係止面26bが当たった後端規制
 面31bになっている。更に、カバー30の中央部には
 前記操作部29が前後方向に移動可能に嵌合する窓32
 が形成されている。

【0027】前記案内ピン12, 13、案内長孔16,
 17、抜き治具25、操作部29などにより解除手段3
 3を形成している。

【0028】前記各部材には共通する位置に取付穴3
 4が形成され、該各取付穴34にビス35などの連結
 部材を挿通して各部材を一体的に連結し、ナット1を構
 成している。

【0029】次に前記実施例のナット1を使用して、例
 えばパネル相互を連結する操作について説明する。

【0030】前記ナット1を図1及び図5に示すよ
 うに、一方のパネル50の連結側端面50aにナット1の
 ボルト挿通孔40の挿入側端が位置するように一方のパ
 ネル50に適宜手段で固定して備え、また、ボルト5
 を、その先端が他方のパネル60の連結側端面60aより
 突出させて適宜手段により他方のパネル60に固定し
 て備える。

【0031】そして、両係止部材10, 11が前方に位
 置して、そのねじ溝10a, 11aの相互間隔がボルト
 5のねじ溝5aの直径よりも短い間隔にある状態にお
 いて、両パネル50, 60を相互に接近してボルト5をナ
 ット1のボルト挿入孔40へ挿入すると、まず、図7又
 は図8又は図9に示す位置にある係止部材10, 11の
 先端部にボルト5の先端部が当たって係止部材10, 11
 がコイルスプリング20, 21の付勢力に抗して奥部へ
 押し移動される。この係止部材10, 11の移動は案内
 長孔16, 17とピン12, 13によってテーパー面8,
 9に沿って後方へ移動し、両係止部材10, 11の対向
 間隔が漸次長く(広く)なる。

【0032】そして、ボルト5の挿入によって、両係止
 部材10, 11におけるねじ溝10a, 11aの山部の
 対向間隔がボルト5の山部の直径よりも広くなると、両
 係止部材10, 11はコイルスプリング20, 21の付
 勢力によって前方へ押し移動される。これを繰り返して
 ボルト5が挿入され、両パネル50, 60の連結側端面
 50a, 60aが当接すると、図5に示すように、両係
 止部材10, 11のねじ溝10a, 11aがボルト5の
 ねじ溝5aに噛合した状態での係止部材10, 11が止ま
 る。このとき、両係止部材10, 11のねじ溝10a,
 11a相互が1/2ピッチずれて両ねじ溝10a, 11

aがボルト5のねじ溝5aに啖合し、かつテーパー面10b, 11bがテーパー面8, 9に接触している。

【0033】この状態で、両パネル50, 60に分離しようとする力が作用すると、すなわち、ボルト5にナット1より抜ける方向への力が作用すると、ボルト5のねじ溝5aに啖合している係止部材10, 11に前方への力が作用するが、係止部材10, 11のテーパー面10b, 11bとケース板6, 7のテーパー面8, 9の係合により、係止部材10, 11のねじ溝10a, 11aがボルト5のねじ溝5aに喰い込み、ボルト5の抜け外れが阻止される。このとき、前記のように両ねじ溝10a, 11aを1/2ピッチずらしたことにより、ねじ溝10a, 11aのねじ溝5aへの喰い込み状態で、テーパー面10b, 11bとテーパー面8, 9とが当接状態にあるため、ボルト5の抜け外れが強固に阻止され、両パネル50, 60は相互に強固に連結される。

【0034】したがって、両パネル50, 60を連結する際には、両パネル50, 60を相互に近接する作業のみでよく、従来のようにボルトに対してナットを回転して連結するものに比べて連結作業が容易である。

【0035】次に、前記の連結状態から両パネル50, 60を分離する場合には、カバー30に露出した操作部29の先端を手操作で後方(図1の矢印A方向)へ移動させて両係止部材10, 11を後方へ移動させる。これにより、両係止部材10, 11が案内長16, 17によって両係止部材10と11間の間隔φが広がり、その間隔φが、ボルト5の山部の直径より大きくなるとボルト5を抜き外すことができ、このボルト5を抜き外すことにより両パネル50, 60を分離することができ。

【0036】この分離作業においてもナット1を従来のように回転する必要がなく、分離作業も容易に行える。

【0037】なお、前記実施例においては、螺旋状のねじ溝5aを有するボルト5を使用した例であるが、このボルト5を、図10に示すように、外周に螺旋溝ではなく、リング状の溝5cを形成した連結棒5Aとし、前記係止部材10, 11のねじ溝10a, 11aを前記リング状の溝5cに嵌合する非傾斜溝10c, 11cとしてもよい。

【0038】更に、前記実施例においては、ねじ溝5aを有するボルト5やリング溝5cを有する連結棒5Aを使用した、図11に示すような、表面に軸方向において凹凸面を有しない丸棒状の連結棒5Bや図12に示すような角棒状の連結棒5Cを使用してもよい。このような非凹凸面の連結棒5B, 5Cであっても両係止部材10, 11の内側面を前記のように先尖状の凹凸面に形成することにより、この凹凸面が前記連結棒5B, 5Cに喰い込み、前記と同様の連結が可能である。なお、図12に示すような角棒状の連結棒5Cを使用する場合には、両係止部材10, 11の内側面を図6(c)又は図10(c)において円弧とすることなく、上下方向の直

線からなる凹凸面にする。

【0039】更に、前記両係止部材10, 11の内側面を、前記のようにねじ溝からなる凹凸面に形成することなく図13に示すように、前記ボルト挿通孔の軸心と平行する平坦面10d, 11dに形成してもよい。この場合には、前記のようなボルト5や連結棒5Aを使用することにより、そのねじ溝5aの山やリング溝5cの山が両係止部材10, 11の平坦面10d, 11dに喰い込み、前記実施例と同様に連結することができる。

【0040】また、前記実施例においては、ナット1のボルト挿入孔40を、ナット1の前後方向に貫通させたが、このボルト挿入孔40の後部は閉塞してもよい。

【0041】また、本発明のナット1は、前記のようなパネルの連結のものに限るものではなく、その他の部品の連結にも使用できることは勿論である。

【0042】

【発明の効果】以上のようなことから、本発明のナットは、ボルトや外周に凹凸面を有する丸棒や角棒などの連結棒に対して回転することなく連結できるため、従来のような回転して連結するナットに比べて連結作業が容易である。

【0043】更に、本発明のナットをボルトに螺合する場合には、そのボルトのねじの一部が破損していても、ナットを挿通できる。

【0044】更に、本発明のナットは、2個の係止部材を1つの平面上において対向して配置したので、前記従来のように溝付セグメントを全周に配置するものに比べて、ナットを板状に薄く形成することができる。そのため、狭い場所での連結に有効である。

【0045】更に、部品のほとんどを平板で形成できるため、プレスや鍛造で部品を製造でき、製造コストの低減を図ることができる。

【0046】また、請求項5の発明によれば、連結したナットを回転することなく容易に外すことができる。

【図面の簡単な説明】

【図1】本発明の実施例を示す斜視図。

【図2】本発明のナットの前面図。

【図3】図1におけるB-B線断面図。

【図4】本発明のナットの部品を分解した斜視図。

【図5】本発明のナットにおいて表カバーを外した状態の平面図。

【図6】本発明のナットをボルトと連結する実施例におけるボルトと係止部材を示すもので、(a)はボルトの側面図、(b)は係止部材の内側面図、(c)は(b)におけるC-C線断面図。

【図7】本発明における係止部材の配置状態を示す平面図。

【図8】本発明における係止部材の他の例を示す平面図。

【図9】本発明における係止部材の更に他の例を示す平

面図。

【図10】本発明のナットを非螺旋状のリング溝を形成した連結棒と連結する実施例における連結棒と係止部材を示すもので、(a)は連結棒の側面図、(b)は係止部材の内側面図、(c)は(b)におけるD-D線断面面図。

【図11】本発明のナットと連結する連結棒の他の例を示す斜視図。

【図12】本発明のナットと連結する連結棒の更に他の例を示す斜視図。

【図13】本発明の係止部材の他の例を示す斜視図。

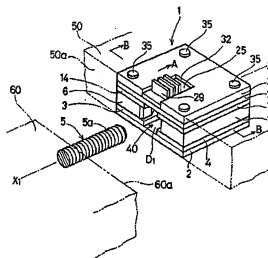
【符号の説明】

- 1 ナット
2 裏カバー

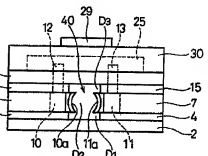
- * 3, 4 裏スペース
5, 5A~5C 連結棒
6, 7 ケース板
8, 9 テーパー面
10, 11 係止部材
10a, 11a, 10c 凹凸面
10d, 11d 平坦面
12, 13 案内ピン
14, 15 表スペース
16, 17 案内長孔
20, 21 付勢手段
22 表カバー
33 解除手段

*

【図1】



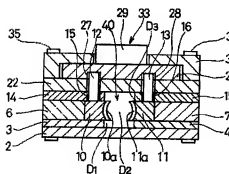
【図2】



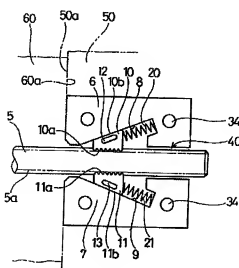
【図11】



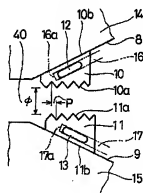
【図3】



【図5】



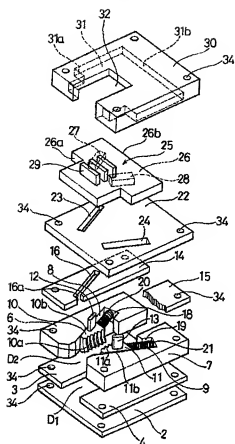
【図7】



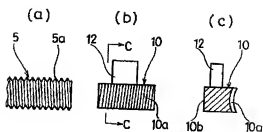
【図12】



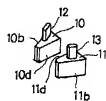
【図4】



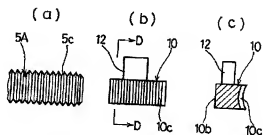
【図6】



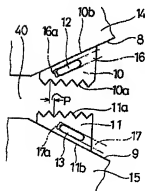
【図13】



【図10】



【図8】



【図9】

